M.V. Luong1, M.O. Benoit2, J.L. Paul1, E. Abegel3, H. Raffec3, R. Khedira3, L. Auziere4, H. Diebold3, B. Diebold3. 1Georges Pompidou European Hospital, Cardiology department, Paris, France; 2Paulo University, Cardiopatias Gerais, Sao Paulo, Brazil; 3Biochemical department, Paris, France; 4Georges Pompidou European Hospital, Cardiology department, Paris, France

Aim: To evaluate the incremental value of sophisticated evaluation of left-ventricular filling pressure for determining systolo-diastolic interactions.

Methods: 51 patients underwent echography to evaluate systolic (ejection fraction (EF)), and diastolic functions (mitral Doppler for E/A, deceleration time(DT), E wave flow propagation velocity (Vp), early diastolic velocity of lateral mitral annulus (Ea)) and BNP.

Results: Significant increases of BNP between the 3 tertiles for E/Ea(p<0.01), E/A(Ea/gp<0.05), DT, EF, PAP(p<0.001) were obtained. Combination of EF with diastolic indexes provided “echographic severity” profiles associated with elevated BNP(Table) and led to striking differences for EF and E/Vp(p<0.0001)(Picture).

Systolo-diastolic interactions and BNP

<table>
<thead>
<tr>
<th>Systolo-diastolic model</th>
<th>Best tertile</th>
<th>Intermediate</th>
<th>Worse tertile</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>EF/E/Vp</td>
<td>227±80</td>
<td>480±60</td>
<td>890±81</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>EF/E/A</td>
<td>244±91</td>
<td>536±86</td>
<td>811±85</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>EF-DT</td>
<td>255±85</td>
<td>522±100</td>
<td>797±81</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>EF/Ea restrictive pattern</td>
<td>281±79</td>
<td>547±84</td>
<td>893±76</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>EF/Ea restrictive pattern</td>
<td>296±117</td>
<td>469±191</td>
<td>783±111</td>
<td>&lt;0.05</td>
</tr>
</tbody>
</table>

For each X parameter:Best tertile: EF-E/Vp 227; Intermediate: 480; Worse tertile: 890.

Conclusion: In patients suspected of heart failure, BNP levels are related to systolic dysfunction but also by the severity of associated diastolic dysfunction.

130 Diastolic filling vortex in the normal left ventricle. T. Ishizu1, T. Ishimitsu2, Y. Seo2, K. Obara2, N. Moriyama3, I. Yamaguchi2.

1University of Tsukuba, Cardiovascular division, Tsukuba, Japan; 2Tsukuba, Japan; 3University of Tsukuba, Cardiovascular division, Tsukuba, Japan

Objectives: The aim of this study was to clarify the diastolic filling flow characteristics in the normal left ventricle.

Background: During left ventricular filling, basically oriented velocities are seen in the outflow compartment. These velocities may represent vortex formation at basal level or blood returned from the apical region.

Methods: Left ventricular flow patterns were visualized in 13 healthy individuals (age 33 ± 8 years) with the use of contrast enhanced two-dimensional echocardiography techniques. Intraventricular microbubble traces were identified by frame-by-frame analyses of the apical long axis view (frame rate 86 or 121 Hz).

Results: During early transmirtal flow acceleration, two or three mushroom-shaped fluid components were created in sequence. Around the mitral valve maximum opening and semi-closure, the anterior part of the mushroom-shaped-fluid component, which was at the level of the mid-ventricle, moved toward basally and create the clockwise swirling vortex occupying the outflow compartment behind the anterior mitral leaflet. Other mushroom-shaped fluid components transformed into the several vortices and traveled to the apical region, which represent the apical branches of the E wave on the M-mode color Doppler. During diastasis, vortices breakdown occurred in basal left ventricle.

Conclusion: A common diastolic flow characteristic was identified in the normal left ventricle. The results revealed that the retrograde velocities in the outflow compartment were the part of the filling flow vortex at the basal left ventricle behind the anterior mitral leaflet. The returned flow from the apical region into the outflow was not observed during early diastole in normal human heart.

131 Mitral E- wave velocity to inflow propagation velocity ratio in assessment of left ventricular diastolic dysfunction in patients with low ejection fraction. A. Wojtarowicz, M. Peregud-Pogorzelska, E. Plofierska. Department of Cardiology, Szczecin, Poland

Left ventricular (LV) diastolic function is an important diagnostic and prognostic factor in many clinical states. Inflow propagation velocity (Prop) is known as preload independent method in LV diastolic function estimation, however in patients with low LV ejection fraction (EF) with unfavorable restrictive filling pattern (RES) further Prop decrease is not found. The aim of our work was to evaluate of mitral E wave velocity to Prop ratio (E/Prop) as a potentially more sensitive than Prop index in LV diastolic dysfunction estimation.

The studied groups enrolled 134 individuals with EF < 35%, on sinus rhythm and without significant valvular diseases. The patients were divided into three groups: 1) with impaired relaxation (REL) - 39 pts; 2) with pseudonormal pattern (PN) - 53 pts; and 3) restrictive flow pattern (RES) - 42 pts. The studied groups did not differ significantly regarding age, heart rate and EF values. In control group was 25 healthy persons. Inflow pattern was measured on mitral orifice level by PW-Doppler, and Prop in 4 chamber apical view using M-mode color Doppler.

Results: In control group the values of the studied parameters were as follows: Prop 69±10.8 m/s, and E/Prop 0.93±0.23. Maximal value of E/Prop was 1.3. In the studied groups the Prop values were as follows: in RES 39±1±9.0 m/s, in PN 37±7±7.3 m/s, and in REL 33±2±8.8 m/s. The differences between REL and other groups were significant (P<0.01). The E/Prop values were as follows: in the RES group: 2.5 ± 0.6; PN: 2.12 ± 0.7, and REL: 1.45 ± 0.6. The differences between all studied groups was statistically significant (REL vs the remaining groups: P<0.0001, RES vs PN: P<0.01). In all patients in assessed groups Prop was higher, than in healthy individuals.

Conclusions: 1. LV function impairment cause decrease of Prop and increase of E/Prop ratio. 2. In similar LV systolic function impairment, E/Prop ratio is higher in more pronounced diastolic dysfunction.

S6 Abstracts

Eur J Echocardiography Abstracts Supplement, December 2003